

FINAL REPORT

Microbiological Sampling Report

for

National Oceanic & Atmospheric Administration

**Small Abatement Conducted in the Room 15327 of Building SSMC-3
in December 1999 and January 2000**

Interagency Agreement #: D8H00CO31200

Task: 9903

January 22, 2000

Prepared by
US Public Health Service
Division of Federal Occupational Health
Bethesda Central Office

Executive Summary

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted a small-scale drywall removal project in room 15327 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. The visibly contaminated drywall was removed according to FOH's protocol (Attachment A) in the evening of December 10, 1999. The room was then thoroughly cleaned by wet-wiping and High Efficiency Particulate Air (HEPA) vacuuming. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from this room and an indoor reference room 15212. Air samples were also collected from outdoors. Initially, samplings were conducted at three time periods: before (refer as Pre-), immediately after (refer as Post-I), and one-week after (refer as Post-II) removal of the contaminated drywall and thorough cleaning of this room. Based on results from the Post-II sampling, a second thorough cleaning was conducted in room 15327 during the weekend of January 21 – 23, 2000. Another full-scale post-cleaning sampling was conducted on January 24, 2000 and February 1, 2000 (refer as Post-III).

Some findings are as follows:

· *Stachybotrys chartarum* and *Penicillium* were the predominant fungi recovered from the interior side of removed drywall, perforated paper and plastic surfaces on the window frame, exterior paper wrapping of fiberglass insulation materials, and surfaces of concrete pre-cast in the wall cavity.

- Indoor fungal levels were lower than those of outdoors and fungi detected indoors were similar to those detected outdoors.
- *Stachybotrys chartarum* was present at low levels in the air of room 15327 during Post-I sampling and this fungus was not detected from Post-II and Post-III samplings.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- Fungal genera recovered from horizontal and vertical surfaces and carpet and furniture dust were similar to those recovered from outdoor air samples.
- *Cladosporium* was the predominant fungal genus recovered from surfaces in reference room 15212. However, *Penicillium* was the predominant one recovered from room 15327.
- *Stachybotrys chartarum* was detected once, from one contact plate sample collected from the vertical surface of room 15327 on December 21, 1999, one week after drywall removal and cleaning. This fungus was not detected from samples collected after second cleaning.
- Fungal levels on horizontal and vertical surfaces were very low after second cleaning of room 15327.
- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- Fungal burden on dust samples collected from carpet and furniture were at $10^3 - 10^5$ CFU/g levels.
- Consistent presence of *Stachybotrys chartarum* in carpet dust of room 15327 was detected throughout this project.
- *Stachybotrys chartarum* was detected from furniture dust in room 15327 after abatement and cleaning, but was not detected after second cleaning.

Overall, fungal burden on various surfaces in room 15327 was low after the second cleaning of this room. Airborne fungal levels and total fungal spores in the air in room 15327 were lower than those of outdoors and were compatible to those of the reference room 15212. Fungal levels in composite furniture dust decreased from 10^4 to 10^3 CFU/g of fine dust after second cleaning of room 15327. However, fungal levels in carpet dust remained at the 10^4 CFU/g of fine dust level and consistent presence of *Stachybotrys chartarum* was detected.

Recommendations were as follows:

- HEPA vacuum and wet-wipe of the open edge of bookshelf in room 15212.
- Revise the small-scale drywall removal protocol to prevent spores release to the carpet during drywall removal (Attachment D).
- Use HEPA vacuum cleaner as a routine housekeeping of the carpeting in the building.
- Implement an emergency water intrusion protocol for this building to adequately manage the unexpected water intrusion in order to prevent any fungal proliferation.

INTRODUCTION

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted a small-scale drywall removal project in room 15327 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. The visibly contaminated drywall was removed according to FOH's protocol (Attachment A) in

the evening of December 10, 1999. The room was then thoroughly cleaned by wet-wiping and High Efficiency Particulate Air (HEPA) vacuuming. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from this room and an indoor reference room 15212. Air samples were also collected from outdoors. Initially, samplings were conducted at three time periods: before (refer as Pre-), immediately after (refer as Post-I), and one-week after (refer as Post-II) removal of the contaminated drywall and thorough cleaning of this room.

Based on results from the Post-II sampling, a second thorough cleaning was conducted in room 15327 during the weekend of January 21 – 23, 2000. Another full-scale post-cleaning sampling was conducted on January 24, 2000 and February 1, 2000 (refer as Post-III).

EVALUATION METHODOLOGY

Pre-abatement Sampling on December 9, 1999

Various types of samples were collected from room 15327 and a reference room 15212 which was selected by NOAA based on no history of water damage and no visible fungal growth on the window sill areas. Sampling was conducted on December 9, 1999, before the initiation of drywall removal. Results from this sampling were used as baseline information.

In each room, two air sampling locations were selected, one by the window area and the other in the center of the room. Outdoor air samples were collected near the entrance of the building. Two types of air samples were collected: (1) culturable method using Andersen[®] N-6 samplers at a flow rate of 28.3 L/min, and (2) non-culturable method using Zefon[®] Air-O-Cell cassettes at a flow rate of 15 L/min. Indoor Andersen[®] air samples were collected for 3 minutes and outdoor samples were collected for both one and three minutes. Two percent (2 %) malt extract agar (MEA) and cellulose Czapek agar (CCA) was used to recover general fungi and cellulose-loving fungi, respectively. Non-culturable air samples were collected at the aforementioned sampling locations. Indoor samples were collected from ten minutes and outdoor samples were collected for both five and ten minutes. Temperature and relative humidity measurements were collected from each air sampling location by a battery operated, direct readout Hygroskop[®] meter.

To determine fungal burden on horizontal and vertical surfaces of these rooms, eight contact plate samples were collected from each room. Four samples were collected from randomly selected horizontal surfaces and four from the randomly selected vertical surfaces. Sampling was conducted by pressing the MEA-filled Rodac[®] plate against the surface of interest for five seconds.

Swab samples were collected from surfaces of each supply diffusers and return troughers in each room. They were collected by wiping a known area of surface with a sterile cotton swab (Culturette[®]) wetted with holding media. Approximately 5 in² area was wiped for return trougher and 4 in² for supply diffusers. The swab was then placed directly into its holder. Each holder was labeled with an identifiable number. Nine wipe samples were collected from room 15327 and four samples from room 15212.

Dust accumulated on carpeting and chairs and fabric system furniture were collected with a High Efficiency Particulate Air (HEPA) vacuum attached with a special “sock” device. For each carpet sample, a 3-ft by 3-ft area was vacuumed for

at least five minutes. Dust on surfaces of system furniture and chairs were vacuumed, with a total area of 9 ft², and composite as one sample. One carpet sample and one composite furniture sample were collected from each room.

All samples collected were sent to FOH's Environmental Microbiology Laboratory (EML) in Philadelphia, Pennsylvania for analysis.

Contaminated Drywall Removal on December 10, 1999

Personnel from Facility Management and FOH observed a representative from the Foulger Pratt performed the small-scale removal of drywall near the windowsill of room 15327 on Friday, December 10, 1999. This small-scale removal of contaminated drywall began at about 7:00 p.m. after shut down of the ventilation system. The plastic sheeting and duct tape, which covered the visibly fungal contaminated area, were peeled off. Representative from the Foulger Pratt used a utility knife to cut a drywall of about 1-ft by 1-ft area which included visibly fungal growth areas (Exhibit 1). The black fungal growth was observed about 6 inches above the base of the window frame (Exhibit 1). Fungal growth also penetrated into the plastic layer on the window frame. Visible fungal growth was also detected from the paper wrapping outside of the insulation materials in the wall cavity (Exhibit 1). With the aids of a flashlight and a hand-held mirror, the interior surfaces of the drywall immediately adjacent to the cut-off areas were visually inspected (Exhibit 2). Due to detection of black fungal growth on the interior surfaces of the drywall, another inch of the drywall (from top) was cut. Visible fungal growth was not detected from any other areas inspected. Total area of the removed drywall was about 14" x 16". Then, the drywall cut-off and surrounding areas were cleaned with a HEPA vacuum cleaner. The representative from Foulger Pratt patched the open drywall area with a green drywall and screwed it in place (Exhibit 3). The room was then thoroughly cleaned according to FOH's cleaning protocol (Attachment A) during that weekend.

Two wipe samples were collected from the concrete pre-cast in the wall cavity. Two wipe samples were collected on plastic surfaces behind removed drywall. Two tape-lift samples were collected for microscopic examination: one from the plastic surface and the other from the exterior paper wrapping of fiberglass insulation materials. The removed drywall with paper and plastic materials on the window frame, and a small piece of exterior paper wrapping, the wipes, and tape-lift samples were expressed mailed to FOH's EML in Philadelphia, PA.

Post-abatement Microbiological Samplings on December 21, 1999

The exact same sampling was conducted on Monday, December 13, 1999, after this small-scale drywall removal and cleaning. Due to delay receipt of wipe samples at the EML, wipe samples on diffuser surfaces were retaken on December 15, 1999. Another full-scale sampling was conducted on December 21, 1999, approximately one week after drywall removal and cleaning.

Samplings Conducted after Second Cleaning

Another full-scale microbiological sampling was conducted on January 24, 2000 after the second thorough cleaning of this room during the weekend of January 21-23, 2000. Wipe samples were re-collected on February 1, 2000 due to delay receipt of these samples at the EML.

Laboratory Procedures

Upon receipt, all Andersen[®] air and contact plate samples were incubated in a 25°C incubator. Sub-samples were collected from the removed drywall and the paper-wrapping samples. Three sub-samples of 1-inch by 1-inch area were cut from the

interior surface of the removed drywall sample. Three sub-samples, each of 1 square inch, were cut from the paper wrapping for analysis. Six wipe samples were also collected from the removed drywall and perforated paper and plastic materials on the window, by wiping one square inch of black fungal growth area with Culturesettes[®].

Each swab sample was suspended in sterile distilled water, diluted serially, and inoculated onto agar plates. Both MEA and CCA were used for retrieving fungi. At least three dilution series were used for each sample. Each vacuum dust sample was sieved through a 250 mm sieve. The fine dust (< 250 mm) retrieved was then weighed and followed the dilution plating for fungal analysis. All bulk samples were weighed and followed the aforementioned dilution plating.

All plates were incubated in a 25°C incubator. They were examined every other day for up to 10 days to ensure the full recovery of fungi. Fungal identification was based on colony morphology, spores and conidia formation. Total fungal colonies formed on each MEA plate and *Stachybotrys chartarum* on CCA plates were counted and recorded. Fungal levels in samples were presented as colony forming units (CFUs) per measuring unit. For example, CFU/m³ for Andersen[®] air samples, CFU/in² for wipe samples, CFU/plate for contact plate samples, CFU/g for bulk, and CFU/g of fine dust for dust samples.

All Zefon[®] cassettes and tape-lift samples were analyzed by the Environmental Microbiology Laboratory in Escondido, California for direct microscopic examination. Fungal spores were identified and their airborne levels were presented as spores/m³. Qualitative information was provided for tape-lift samples.

RESULTS AND DISCUSSION

Temperature and Relative Humidity

Temperature and relative humidity measurements are presented in Table 1. In general, outdoors had lower temperature and higher relative humidity readings. Indoor temperature and relative humidity readings ranged from 71.4°F to 75.1°F, and 16.6% - 25.1%, respectively.

Table 1. Temperature (Temp.) and relative humidity (Rh) readings in outdoors and rooms 15212 and 15327 of SSMC-3, at different dates.

| Locations | 15212 | | 15327 | | Outdoors | |
|------------|-------|------|-------|------|----------|------|
| | Temp. | Rh | Temp. | Rh | Temp. | Rh |
| Parameters | (°F) | (%) | (°F) | (%) | (°F) | (%) |
| Dates | | | | | | |
| 12/9/1999 | 74.4 | 25.1 | 73.3 | 24.7 | 52.0 | 49.4 |
| 12/13/1999 | 72.4 | 24.9 | 73.4 | 23.2 | 49.8 | 53.8 |
| 12/21/1999 | 72.1 | 31.8 | NA | NA | 44.5 | 52.6 |
| 1/24/2000 | 71.4 | 18.2 | 75.1 | 16.6 | NA* | NA |

* Not available.

Microbiological Results

All laboratory analytical reports from FOH's EML are presented in Attachment B. Results from swab and bulk samples collected from the removed drywall and paper wrapping are presented in laboratory reports #NOAA-00-12R and #NOAA-00-14R. The laboratory report #NOAA-00-11R-A, -B, and -C contain results of air and contact plate, surface wipe, and vacuum dust samples collected on December 9, 1999 (Pre-abatement). Similarly, reports #NOAA-00-13R and #NOAA-00-15R contained results, respectively, from post-abatement sampling conducted immediately (Post-I) and one-week after (Post-II) the abatement and cleaning. Results from air, contact plate, and dust samples collected on January 24, 2000 are presented in a laboratory report #NOAA-00-21R. Results from wipe samples collected on February 1, 2000 are presented in a report #NOAA-00-23R.

Results from microscopic examination of Zefon^â cassettes and tape-lift samples are presented in Attachment C.

The Extent of Contamination

Stachybotrys chartarum and *Penicillium* were the predominant fungi recovered from the removed drywall and paper wrapping (Table 2). Total fungal levels on these samples were at $10^6 - 10^7$ CFU/g. All wipe and bulk samples showed presence of *Stachybotrys chartarum* on CCA plates. Wipe samples collected from the interior side of the removed drywall showed a fungal level of 10^6 CFU/in². Fungal levels on visibly fungal contaminated surfaces behind the drywall were $10^5 - 10^6$ CFU/in². *Stachybotrys chartarum* were observed on tape-lift samples as the predominant fungus, followed by colorless *Penicillium/Aspergillus* group. These results confirm that *Stachybotrys chartarum* and *Penicillium/Aspergillus* dominated these samples.

Samples collected from concrete pre-cast also showed predominance of *Penicillium* and presence of *Stachybotrys chartarum*. Two samples were collected from plastic surfaces on the window frame behind the removed drywall: one on visible growth area and the other on surfaces of no visible growth. *Penicillium* and *Stachybotrys chartarum* were detected from both samples. The sample collected from the visible growth area had a fungal level at least 1,000 times higher than the control one (report #NOAA-00-12R, samples #W03 and W04).

Table 2. Mean fungal levels of bulk and wipe samples collected from room 15327 of SSMC-3, on December 10, 1999.

| Sample Types/Descriptions | <i>Penicillium</i> levels on MEA | SC* levels on MEA | Total levels on MEA | Presence of SC on CCA |
|---|----------------------------------|-------------------|---------------------|-----------------------|
| Bulk Samples | | | | |
| Removed drywall (CFU/g) | 10,720,010 | 1,235,613 | 11,955,622 | +** |
| Paper wrapping outside of fiberglass insulation materials (CFU/g) | 881,766 | 874,250 | 1,756,015 | + |
| Wipe Samples | | | | |
| Removed drywall interior surfaces (CFU/in ²) | 2,990,000 | 270,000 | 3,260,000 | + |

| | | | | |
|--|-------|-----------|-----------|---|
| Perforated paper surfaces behind the removed drywall (CFU/in ²) | 2,000 | 5,092,000 | 5,094,000 | + |
| Perforated plastic surfaces behind the removed drywall (CFU/in ²) | 6,000 | 754,000 | 760,000 | + |
| Concrete pre-cast (CFU/in ²) | 5,450 | 205 | 5,655 | + |

* SC: *Stachybotrys chartarum* was detected.

** SC was detected on CCA plates of these samples.

Air Samples

Andersen Results

Mean outdoor airborne fungal levels were much higher than those of indoors (Table 3). *Cladosporium*, *Penicillium*, and Basidiomycetes dominated outdoor fungal flora. Fungi detected indoors were *Cladosporium*, *Aspergillus*, and Basidiomycetes.

Stachybotrys chartarum was detected on CCA plates, from one of eight outdoor samples (sample #OM2-120999 in report #NOAA-00-11R-A), with a level of 71 CFU/m³. This fungus was also detected on CCA plates, from both samples collected in room 15327 immediately after (Post-I) abatement and cleaning (samples #15327M1, M2-121399 in report #NOAA-00-13R-A), both at 12 CFU/m³. But, *Stachybotrys chartarum* was not detected during Post-II and Post-III samplings.

Zefon Results

Mean outdoor fungal levels were higher than those of indoors (Table 3). Fungal spores detected indoors were similar to those of outdoors. Basidiospores and Ascospores dominated outdoor fungal flora followed by *Cladosporium*, and *Penicillium/Aspergillus* types. Indoor fungal flora were dominated by *Cladosporium*, and *Penicillium/Aspergillus* types.

Stachybotrys chartarum was detected from one sample collected in room 15327 immediately after (Post-I) abatement and cleaning (samples #90749, in Attachment B), at 7 spores/m³. *Stachybotrys chartarum* was not detected from Post-II and Post-III samplings.

Results from both Andersen^â and Zefon^â air samplings showed similar trends: (1) indoor fungal levels were lower than those of outdoors, (2) fungi detected indoors were similar to those detected outdoors, and (3) *Stachybotrys chartarum* was present at low levels in the air of room 15327 during Post-I sampling and this fungus was not detected from Post-II and Post-III samplings.

Table 3. Mean airborne fungal levels in indoor and outdoors, collected by Andersen^â N-6 and Zefon^â samplers at

different periods of time.

| Room | Andersen ^â N-6 (CFU/m ³) | | | | Zefon ^â (Spores/m ³) | | | |
|-----------------|--|---------|----------|-------------------|--|--------|---------|------------------|
| | Pre-* | Post-I* | Post-II* | Post-III* | Pre- | Post-I | Post-II | Post-III |
| 15327 | 6 | 24 (+@) | 47 | < 12 [#] | 74 | 68 (+) | 51 | 7 [#] |
| 15212 | 42 | 30 | 36 | < 12 [#] | 134 | 63 | 37 | < 7 [#] |
| Outdoors | 377 (+) | 335 | 684 | 94 | 2,283 | 3,237 | 5,710 | 27 |

* Pre-: Pre-abatement sampling on December 9, 1999.

Post-I: Post-abatement sampling on December 13, 1999.

Post-II: Post-abatement sampling on December 21, 1999.

Post-III: Sampling conducted on January 24, 2000, after second cleaning.

@ *Stachybotrys chartarum* was detected.

Only one indoor sample was collected from each room for Post-III sampling.

Wipe Samples

Most (49 out of 52) samples collected from surfaces of supply diffusers and return troughers in light fixtures were below the detection limits of 2 CFU/in². Fungal levels of the three samples, where fungi were detected, ranged from 2 CFU/in² to 10 CFU/in². Fungi detected were yeast, *Penicillium*, and *Chaetomium*. *Stachybotrys chartarum* was not detected from any samples.

Contact Plate Samples

In general, higher fungal levels were detected from the horizontal surfaces than vertical surfaces (Table 4). In each room, on each horizontal or vertical surface, mean fungal level differences were not detected from different sampling periods ($p > 0.05$) (Table 4).

Table 4. Mean fungal levels (CFU/plate) on horizontal and vertical surfaces of rooms 15327 and 15212 by contact plate sampling collected at different period of time.

| Room | Surfaces | Pre-* | Post-I* | Post-II* | Post-III* |
|-------|------------|------------------------|-------------|------------|-------------|
| 15327 | Vertical | 1.0 ± 0.7 [#] | 0.0 ± 0.0 | 3.0 ± 2.0 | 0.0 ± 0.0 |
| 15212 | Vertical | 1.5 ± 0.9 | 1.0 ± 0.7 | 1.0 ± 0.4 | 2.5 ± 1.7 |
| 15327 | Horizontal | 9.3 ± 3.8 | 25.3 ± 19.0 | 7.8 ± 5.3 | 0.5 ± 0.5 |
| 15212 | Horizontal | 6.5 ± 2.7 | 10.3 ± 7.0 | 12.3 ± 8.6 | 19.8 ± 17.1 |

* Pre-: Pre-abatement sampling on December 9, 1999.

Post-I: Post-abatement sampling on December 13, 1999.

Post-II: Post-abatement sampling on December 21, 1999.

Post-III: Sampling conducted on January 24, 2000, after second cleaning.

Mean \pm standard error (sample number = 4).

In reference room 15212, fungal levels ranged from below the detection limits (BDL) of 1 CFU/plate to 71 CFU/plate. Fungal genera detected in a descending order, were *Cladosporium*, *Alternaria*, *Chaetomium*, Basidiomycetes, *Penicillium*, and *Aureobasidium*. The consistently higher fungal levels (13 – 71 CFU/plate) were detected from open edge of bookshelf with *Penicillium* and *Chaetomium* as dominant fungi.

Fungal levels in room 15327 ranged from BDL of 1 CFU/plate to 82 CFU/plate. *Penicillium* followed by *Alternaria* and *Cladosporium*, were the predominant fungal genera detected in this room. The highest fungal level (82 CFU/plate), with predominant *Penicillium* (81 CFU/plate), was detected from a sample collected from horizontal surfaces in room 15327 immediately after cleaning (Post-I) (sample #15327CP8-121399 in report #NOAA-00-13R-A). One of four samples collected after one-week of cleaning (Post-II) also showed predominant *Penicillium* (23 CFU/plate) (sample #15327CP5-122199 in report #NOAA-00-15R-A). Very low fungal levels were detected from samples collected from this room after the second cleaning (Table 4). *Stachybotrys chartarum* (4 CFU/plate) was detected once from one sample collected on vertical surfaces of room 15327 on Post-II sampling (sample #15327CP4-122199 in report #NOAA-00-15R-A). This fungus was not detected during Post-III sampling after second cleaning.

Vacuum Dust Samples

Fungal analysis was not performed on carpet dust sample collected from room 15212 on December 21, 1999 due to insufficient fine dust collected. Fungal levels in the fine dust of carpet and furniture ranged from 10^3 CFU/g to 10^5 CFU/g of fine dust (Table 5). Fungi detected were *Cladosporium*, *Alternaria*, *Aureobasidium*, *Epicoccum*, *Paecilomyces*, and *Penicillium*.

Fungal levels in carpet dust of the reference room 15212 were at 10^3 - 10^4 CFU/g of fine dust levels (Table 5). *Cladosporium* was the predominant fungal genus detected from carpet dust in this room. Dust collected from carpet in room 15327 had fungal levels consistently at 10^4 CFU/g of fine dust levels with *Penicillium* as the predominant fungal genus. *Stachybotrys chartarum* was consistently detected from carpet dust samples collected from room 15327 regardless of sampling time. These results showed carpet in room 15327 harbor fungi such as *Penicillium* and *Stachybotrys chartarum*. The consistent presence of these fungi in carpet dust samples in room 15327 may have resulted from (1) continual supply of these fungal spores in this room, and (2) repeated HEPA vacuuming of these carpet surfaces did not effectively remove the residual spores.

Fungal levels in furniture dust ranged from 10^3 CFU/g to 10^5 CFU/g of fine dust (Table 5). *Cladosporium* was the predominant fungal genus recovered from these samples. *Stachybotrys chartarum* was not detected from samples collected from the reference room 15212. This fungus was detected from room 15327 during the Post-I and Post-II samplings.

Table 5. Fungal levels (CFU/g of fine dust) in fine dust collected from carpet and furniture of rooms 15327 and 15212

by vacuum dust sampling, collected at different period of time.

| Room | Surfaces | Pre-* | Post-I* | Post-II* | Post-III* |
|-------|-----------|--------------|------------|-----------------|------------|
| 15327 | Carpet | 11,600 (+**) | 19,200 (+) | 13,200 (+) | 19,294 (+) |
| 15212 | Carpet | 5,200 (-) | 16,000 (-) | NA [#] | 3,168 (-) |
| 15327 | Furniture | 13,056 (-) | 29,057 (+) | 18,919 (+) | 6,536 (-) |
| 15212 | Furniture | 65,753 (-) | 15,000 (-) | 112,000 (-) | 11,707 (-) |

* Pre-: Pre-abatement sampling on December 9, 1999.

Post-I: Post-abatement sampling on December 13, 1999.

Post-II: Post-abatement sampling on December 21, 1999.

Post-III: Sampling on January 24, 2000, after second cleaning.

** +: *Stachybotrys chartarum* was detected on CCA or MEA plates.

-: *Stachybotrys chartarum* was not detected on CCA and MEA plates.

Data not available.

FINDINGS

- *Stachybotrys chartarum* and *Penicillium* were the predominant fungi recovered from the interior side of removed drywall, perforated paper and plastic surfaces on the window frame, exterior paper wrapping of fiberglass insulation materials, and surfaces of concrete pre-cast in the wall cavity.
- Indoor fungal levels were lower than those of outdoors and fungi detected indoors were similar to those detected outdoors.
- *Stachybotrys chartarum* was present at low levels in the air of room 15327 during Post-I sampling and this fungus was not detected from Post-II and Post-III samplings.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- Fungal genera recovered from horizontal and vertical surfaces and carpet and furniture dust were similar to those recovered from outdoor air samples.
- *Cladosporium* was the predominant fungal genus recovered from surfaces in reference room 15212. However, *Penicillium* was the predominant one recovered from room 15327.
- *Stachybotrys chartarum* was detected once, from one contact plate sample collected from the vertical surface of room 15327 on December 21, 1999, one week after removal and cleaning. This fungus was not detected from samples collected after second cleaning.
- Fungal levels on horizontal and vertical surfaces were very low after second cleaning of room 15327.
- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- Fungal burden on dust samples collected from carpet and furniture were at $10^3 - 10^5$ CFU/g levels.

- Consistent presence of *Stachybotrys chartarum* in carpet dust of room 15327 was detected throughout this project.
- *Stachybotrys chartarum* was detected from furniture dust in room 15327 after abatement and cleaning, but was not detected after second cleaning.

CONCLUSIONS

Overall, fungal burden on various surfaces in room 15327 was low after the second cleaning of this room. Airborne fungal levels and total fungal spores in the air in room 15327 were lower than those of outdoors and were compatible to those of the reference room 15212. Fungal levels in composite furniture dust decreased from 10^4 to 10^3 CFU/g of fine dust after second cleaning of room 15327. However, fungal levels in carpet dust remained at the 10^4 CFU/g of fine dust level and consistent presence of *Stachybotrys chartarum* was detected.

RECOMMENDATIONS

- HEPA vacuum and wet-wipe of the open edge of bookshelf in room 15212.
- Revise the small-scale drywall removal protocol to prevent spores release to the carpet during drywall removal (Attachment D).
- Use HEPA vacuum cleaner as a routine housekeeping of the carpeting in the building.
- Implement an emergency water intrusion protocol for this building to adequately manage the unexpected water intrusion in order to prevent any fungal proliferation.

ATTACHMENT A

SSMC-3 small-scale drywall removal protocol.

ATTACHMENT B

Microbiological laboratory reports for samples collected
from rooms 15327 and 15212 of SSMC-3,
in December, 1999 and January 2000.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-11R-A

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD**POIS#/task #: D8H00CO31200 / 9903****Sampling date: 12/9/99****Dates of inoculation: 12/9/99****General location: SSMC-3, Silver Spring, MD****Specific location: 15th floor****Sampling techniques: Air (Andersen N-6 sampler) and contact plate samplings****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: J. Sobelman****Date characterization completed: 12/20/99****(A) Air samples on MEA and CCA plates**

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-------------|---------------------------------|----------------------|---|--|
| 15327M1, C1 | Room 15327, near window casing | 84.9 | No fungal growth | No |
| 15327M2, C2 | Room 15327, near center of room | 84.9 | CFU/m ³ < 12 1. <i>Alternaria</i> (1*) | No |
| 15212M1, C1 | Room 15212, near window | 84.9 | CFU/m ³ = 12 1. <i>Cladosporium</i> (4) 2. <i>Alternaria</i> (1) | No |
| 15212M2, C2 | Room 15212, table in center | 84.9 | CFU/m ³ = 59 1. <i>Aureobasidium</i> (1) 2. <i>Scopulariopsis</i> (1) CFU/m ³ = 24 | No |

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-----------|-------------------|----------------------|-------------------------|--|
|-----------|-------------------|----------------------|-------------------------|--|

| | | | | |
|----------|-----------------|------|--|--|
| OM1, OC1 | Outside bldg. 3 | 84.9 | <ol style="list-style-type: none"> 1. <i>Penicillium</i> (30) 2. <i>Cladosporium</i> (15) 3. <i>Aspergillus sp.</i> (2) 4. <i>Aureobasidium</i> (1) 5. <i>Paecilomyces</i> (1) | No |
| OM2, OC2 | Outside bldg. 3 | 28.3 | <p>CFU/m³ = 577</p> <ol style="list-style-type: none"> 1. <i>Penicillium</i> (2) 2. <i>Aspergillus niger</i>** (1) 3. <i>Cladosporium</i> (1) 4. <i>Rhizopus</i> (1) <p>CFU/m³ = 177</p> | <p>Yes (2)</p> <p>CFU/m³ = 71</p> |

(B) Contact plate samples on MEA plates

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--|--|
| 15327CP1 | Room 15327, door to room (entrance/exit) | No fungal growth CFU/plate < 1 |
| 15327CP2 | Room 15327, wall near window | No fungal growth CFU/plate < 1 |
| 15327CP3 | Room 15327, front of system furniture, 2 nd station | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (1) 2. <i>Aspergillus sp.</i> (1) 3. Basidiomycetes (1) CFU/plate = 3 |
| 15327CP4 | Room 15327, front of black metal cabinet | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (1) CFU/plate = 1 |

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--------------------------------|--|
| 15327CP5 | Room 15327, top of color laser | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (1) 2. <i>Epicoccum</i> (1) CFU/plate = 2 |

INDOOR AIR QUALITY SURVEY REPORT

| | | |
|-----------------|---|---|
| 15327CP6 | Room 15327, top of grey file cabinet | <ol style="list-style-type: none"> 1. <i>Cladosporium</i> (9) 2. <i>Alternaria</i> (3) 3. <i>Aspergillus sp.</i> (2) 4. <i>Penicillium</i> (2) 5. <i>Aspergillus flavus</i>*** (1) 6. yeast (1) <p>CFU/plate = 18</p> |
| 15327CP7 | Room 15327, top of table in front of window | <ol style="list-style-type: none"> 1. <i>Aureobasidium</i> (3) 2. <i>Cladosporium</i> (3) 3. <i>Penicillium</i> (3) 4. <i>Aspergillus sp.</i> (2) 5. <i>Alternaria</i> (1) 6. Basidiomycetes (1) <p>CFU/plate = 13</p> |
| 15327CP8 | Room 15327, top of scanner | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (2) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) <p>CFU/plate = 4</p> |
| 15212CP1 | Room 15212, wall near entrance | <ol style="list-style-type: none"> 1. <i>Cladosporium</i> (1) <p>CFU/plate = 1</p> |
| 15212CP2 | Room 15212, wall above coffee pot | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (1) <p>CFU/plate = 1</p> |
| 15212CP3 | Room 15212, wall near window | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (2) 2. <i>Chaetomium</i> (1) 3. Basidiomycetes (1) <p>CFU/plate = 4</p> |

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|---|---|
| 15212CP4 | Room 15212, front of shelves (door) opposite desk | No fungal growth CFU/plate < 1 |
| 15212CP5 | Room 15212, top of desk | <ol style="list-style-type: none"> 1. <i>Chaetomium</i> (6) 2. <i>Cladosporium</i> (1) <p>CFU/plate = 7</p> |

| | | |
|----------|---|---|
| 15212CP6 | Room 15212, top of computer | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (3) 2. <i>Aureobasidium</i> (1) 3. <i>Cladosporium</i> (1) 4. <i>Epicoccum</i> (1) <p>CFU/plate = 6</p> |
| 15212CP7 | Room 15212, file cabinet of coffee pot | <p>No fungal growth</p> <p>CFU/plate < 1</p> |
| 15212CP8 | Room 15212, book shelf (open), front of books | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (2) 2. <i>Chaetomium</i> (2) 3. <i>Aspergillus niger</i>** (1) 4. <i>Cladosporium</i> (1) 5. Basidiomycetes (7) <p>CFU/plate = 13</p> |

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-11R-B

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/9/99

Dates of inoculation: 12/10/99

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling technique: Wipe samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 12/20/99

Wipe samples on MEA and CCA plates

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-----------------------------|-------------------------|-----------------|---|---|
| 15327S1 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S2 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S3 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S4 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S5 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327R1 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15327R2 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-----------------------------|-------------------------|-----------------|--|---|
| 15327R3 | Room 15327, return-light | 5 | 10X | 1. <i>Penicillium</i> (1) CFU/in ² = 2 | No |
| 15327R4 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15212S1 | Room 15212, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15212S2 | Room 15212, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15212R1 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15212R2 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |

* Colony counts.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-11R-C**Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD****POIS#/task #: D8H00CO31200 / 9903****Sampling date: 12/9/99****Dates of inoculation: 12/15/99#****General location: SSMC-3, Silver Spring, MD****Specific location: 15th floor****Sampling technique: Vacuum dust sampling****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: J. Sobelman****Date characterization completed: 12/28/99**

Dust samples on MEA and CCA plates

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25°C |
|------------------|--|-------------------|------------------------|--|---|
| 15327V1FC | Room 15327, near center of room, furniture composite | 0.072## | 40X-MEA 10X-CCA | 1. <i>Cladosporium</i> (16*) 2. <i>Alternaria</i> (14) 3. <i>Epicoccum</i> (7) 4. <i>Paecilomyces</i> (4) 5. <i>Aureobasidium</i> (2) 6. <i>Bipolaris</i> (2) 7. <i>Penicillium</i> (2) CFU/g = 1.3 x 10 ⁴ | No |

INDOOR AIR QUALITY SURVEY REPORT

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|-----------|---|-------|--------------------|--|--------------------------|
| 15327V2CA | Room 15327, near center of room, carpet | 0.100 | 40X-MEA 40X-CCA | 1. <i>Penicillium</i> (21) 2. <i>Aspergillus sp.</i> (3) 3. <i>Alternaria</i> (2) 4. <i>Epicoccum</i> (1) 5. <i>Paecilomyces</i> (1) 6. Basidiomycetes (1) CFU/g = 1.2 x 10 ⁴ | Yes (5) CFU/g = 2,000 |
|-----------|---|-------|--------------------|--|--------------------------|

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|---------------------------------|------------|---------------------|--|---|
| 15212V1FC | Room 15212, furniture composite | 0.073## | 400X-MEA 10X-CCA | 1. <i>Alternaria</i> (14) 2. <i>Cladosporium</i> (6) 3. <i>Aureobasidium</i> (1) 4. <i>Paecilomyces</i> (1) 5. <i>Penicillium</i> (1) 6. <i>Rhizopus</i> (1) CFU/g = 6.6 x 10 ⁴ | No |
| 15212V2CA | Room 15212, carpet | 0.100 | 40X-MEA 10X-CCA | 1. <i>Cladosporium</i> (8) 2. <i>Alternaria</i> (3) 3. <i>Aspergillus niger</i> ** (1) 4. <i>Paecilomyces</i> (1) CFU/g = 5,200 | No |

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

Samples processed upon receipt.

5ml of sterilized distilled water were added instead of 10ml.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-12R

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD**POIS#/task #: D8H00CO31200 / 9903****Sampling date: 12/10/99****Dates of inoculation: 12/11/99****General location: SSMC-3, Silver Spring, MD****Specific location: 15th floor, Room 15327****Sampling techniques: Wipe sampling****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: L. Hung****Date characterization completed: 12/20/99**

Wipe samples on MEA and CCA plates

| Sample ID | Sampling Location | Area (in²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25°C |
|--------------------|--|------------------------------|------------------------|---|---|
| 3-15327-121099-W01 | Room 15327, concrete pre-cast | 1 | 10X | 1. <i>Penicillium</i> (10*) 2. <i>Stachybotrys chartarum</i> *** (1) CFU/in ² = 110 | Yes (3) CFU/in ² = 30 |
| 3-15327-121099-W02 | Room 15327, concrete pre-cast | 1 | 400X-MEA 40X-CCA | 1. <i>Penicillium</i> (27) 2. <i>Stachybotrys chartarum</i> *** (1) CFU/in ² = 1.1 x 10 ⁴ | Yes (2) CFU/in ² = 80 |
| 3-15327-121099-W03 | Room 15327, visible growth on plastic behind removed drywall by the window | 1 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (105) 2. <i>Penicillium</i> (40) CFU/in ² = 5.8 x 10 ⁵ | Yes (>400) CFU/in ² > 1.6 x 10 ⁶ |
| 3-15327-121099-W04 | Room 15327, control, no visible growth, wipe on plastic behind removed drywall | 1 | 10X | 1. <i>Penicillium</i> (14) 2. <i>Sporobolomyces</i> (4) 3. <i>Stachybotrys chartarum</i> *** (4) CFU/in ² = 220 | Yes (3) CFU/in ² = 30 |

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|--------------------|-------------------|-------------------------|-----------------|---------------------|---|
| 3-15327-121099-W05 | Control | NA# | 10X | No fungal growth | No |

* Colony counts.

*** Toxigenic fungi.

Not applicable.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-13R-A

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/13/99

Dates of inoculation: 12/13/99

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling techniques: Air (Andersen N-6 sampler) and contact plate samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 12/23/99

(A) Air samples on MEA and CCA plates

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-------------|----------------------------|----------------|--|--|
| 15327M1, C1 | Room 15327, near window | 84.9 | 1. <i>Alternaria</i> (1*) 2. <i>Epicoccum</i> (1) CFU/m ³ = 24 | Yes (1) CFU/m ³ = 12 |
| 15327M2, C2 | Room 15327, center of room | 84.9 | 1. <i>Aspergillus sp.</i> (1) 2. <i>Paecilomyces</i> (1) CFU/m ³ = 24 | Yes (1) CFU/m ³ = 12 |

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|-------------|-------------------------|------|--|----|
| 15212M1, C1 | Room 15212, near window | 84.9 | <ol style="list-style-type: none"> 1. <i>Aspergillus sp.</i> (2) 2. <i>Aureobasidium</i> (1) 3. <i>Cladosporium</i> (1) | No |
| 15212M2, C2 | Room 15212, center | 84.9 | <p>CFU/m³ = 47</p> <ol style="list-style-type: none"> 1. <i>Alternaria</i> (1) <p>CFU/m³ = 12</p> | No |

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-----------|-------------------|----------------|---|--|
| OM1, OC1 | Outside bldg. 3 | 84.9 | <ol style="list-style-type: none"> 1. <i>Cladosporium</i> (11) 2. <i>Penicillium</i> (3) 3. <i>Aspergillus sp.</i> (2) 4. <i>Epicoccum</i> (2) 5. Basidiomycetes (3) | No |
| OM2, OC2 | Outside bldg. 3 | 28.3 | <p>CFU/m³ = 247</p> <ol style="list-style-type: none"> 1. <i>Cladosporium</i> (6) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus niger</i>** (1) 4. <i>Paecilomyces</i> (1) 5. <i>Penicillium</i> (1) 6. Basidiomycetes (2) <p>CFU/m³ = 424</p> | No |

(B) Contact plate samples on MEA plates

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--|-----------------------------------|
| 15327CP1 | Room 15327, door to room (entrance/exit) | No fungal growth CFU/plate < 1 |
| 15327CP2 | Room 15327, wall near window | No fungal growth CFU/plate < 1 |
| 15327CP3 | Room 15327, front of system furniture, 2 nd station | No fungal growth CFU/plate < 1 |

INDOOR AIR QUALITY SURVEY REPORT

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|----------|--|-----------------------------------|
| 15327CP4 | Room 15327, front of black metal cabinet | No fungal growth CFU/plate < 1 |
|----------|--|-----------------------------------|

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|---|--|
| 15327CP5 | Room 15327, top of color laser | 1. <i>Penicillium</i> (9) 2. <i>Alternaria</i> (1) 3. <i>Aureobasidium</i> (1) 4. <i>Cladosporium</i> (1) CFU/plate = 12 |
| 15327CP6 | Room 15327, top of grey file cabinet | 1. <i>Alternaria</i> (1) 2. <i>Penicillium</i> (1) 3. Basidiomycetes (1) CFU/plate = 3 |
| 15327CP7 | Room 15327, top of table in front of window | 1. <i>Penicillium</i> (3) 2. <i>Cladosporium</i> (1) CFU/plate = 4 |
| 15327CP8 | Room 15327, top of scanner | 1. <i>Penicillium</i> (81) 2. <i>Cladosporium</i> (1) CFU/plate = 82 |
| 15212CP1 | Room 15212, door to room | 1. Basidiomycetes (1) CFU/plate = 1 |
| 15212CP2 | Room 15212, wall above coffee pot | 1. <i>Chaetomium</i> (3) CFU/plate = 3 |
| 15212CP3 | Room 15212, wall near window | No fungal growth CFU/plate < 1 |
| 15212CP4 | Room 15212, front of shelves opposite desk | No fungal growth CFU/plate < 1 |
| 15212CP5 | Room 15212, top of desk | 1. <i>Rhizopus</i> (1) CFU/plate = 1 |

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|-------------------|------------------------------|
| | | |

| | | |
|----------|---|--|
| 15212CP6 | Room 15212, top of computer | <ol style="list-style-type: none"> 1. <i>Aureobasidium</i> (2) 2. <i>Cladosporium</i> (1) 3. <i>Epicoccum</i> (1) 4. Basidiomycetes (2) CFU/plate = 6 |
| 15212CP7 | Room 15212, file cabinet of coffee pot | <ol style="list-style-type: none"> 1. <i>Chaetomium</i> (2) 2. <i>Penicillium</i> (1) CFU/plate = 3 |
| 15212CP8 | Room 15212, book shelf (open), front of books | <ol style="list-style-type: none"> 1. <i>Chaetomium</i> (22) 2. <i>Cladosporium</i> (5) 3. <i>Alternaria</i> (2) 4. <i>Aureobasidium</i> (1) 5. <i>Paecilomyces</i> (1) CFU/plate = 31 |

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-13R-B

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/15/99

Dates of inoculation: 12/16/99

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling technique: Wipe samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 12/28/99

Wipe samples on MEA and CCA plates

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-----------------------------|-------------------------|-----------------|---|---|
| 15327S1 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S2 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S3 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S4 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327S5 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15327R1 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15327R2 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-----------------------------|-------------------------|-----------------|--|---|
| 15327R3 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15327R4 | Room 15327, return-light | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15212S1 | Room 15212, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 15212S2 | Room 15212, supply diffuser | 4 | 10X | 1. <i>Chaetomium</i> (1*) CFU/in ² = 3 | No |
| 15212R1 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 15212R2 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |

* Colony counts.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-13R-C**Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD****POIS#/task #: D8H00CO31200 / 9903****Sampling date: 12/13/99****Dates of inoculation: 12/15/99****General location: SSMC-3, Silver Spring, MD****Specific location: 15th floor****Sampling technique: Vacuum dust sampling****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: J. Sobelman****Date characterization completed: 12/28/99**

Dust samples on MEA and CCA plates

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25°C |
|------------------|--|-------------------|------------------------|--|---|
| 15327V1FC | Room 15327, near center of room, furniture composite | 0.053# | 40X-MEA 10X-CCA | 1. <i>Cladosporium</i> (58*) 2. <i>Alternaria</i> (9) 3. <i>Epicoccum</i> (4) 4. <i>Aureobasidium</i> (2) 5. <i>Chaetomium</i> (2) 6. <i>Paecilomyces</i> (1) 7. <i>Penicillium</i> (1) CFU/g = 2.9 x 10 ⁴ | Yes (1) CFU/g = 94 |

INDOOR AIR QUALITY SURVEY REPORT

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|-----------|---|-------|--------------------|--|-----------------------------------|
| 15327V2CA | Room 15327, near center of room, carpet | 0.100 | 40X-MEA 10X-CCA | <ol style="list-style-type: none"> 1. <i>Penicillium</i> (33) 2. <i>Epicoccum</i> (10) 3. <i>Aspergillus niger</i>** (1) 4. <i>Aureobasidium</i> (1) 5. <i>Cladosporium</i> (1) 6. <i>Paecilomyces</i> (1) 7. <i>Pithomyces</i> (1) <p>CFU/g = 1.9 x 10⁴</p> | <p>Yes (4)</p> <p>CFU/g = 400</p> |
|-----------|---|-------|--------------------|--|-----------------------------------|

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|---------------------------------|------------|--------------------|---|---|
| 15212V1FC | Room 15212, furniture composite | 0.020# | 40X-MEA 10X-CCA | <ol style="list-style-type: none"> 1. <i>Alternaria</i> (6) 2. <i>Aureobasidium</i> (2) 3. <i>Cladosporium</i> (2) 4. <i>Aspergillus niger</i>** (1) 5. <i>Bipolaris</i> (1) 6. <i>Chaetomium</i> (1) 7. Ascomycetes (2) <p>CFU/g = 1.5 x 10⁴</p> | No |
| 15212V2CA | Room 15212, carpet | 0.100 | 40X-MEA 10X-CCA | <ol style="list-style-type: none"> 1. <i>Cladosporium</i> (24) 2. <i>Alternaria</i> (9) 3. <i>Epicoccum</i> (4) 4. <i>Chaetomium</i> (2) 5. <i>Rhizopus</i> (1) <p>CFU/m³ = 1.6 x 10⁴</p> | No |

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

5ml of sterilized distilled water were added instead of 10ml.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-14R

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD**POIS#/task #: D8H00CO31200 / 9903****Sampling date: 12/10/99****Dates of inoculation: 12/17/99****General location: Silver Spring, MD****Specific location: SSMC-3, 15th floor, Room 15327****Sampling techniques: Wipe and bulk sampling****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: L. Hung and R. Pickett****Date characterization completed: 12/22/99**

(A) Wipe samples on MEA and CCA plates

| Sample ID | Sampling Location | Area (in²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25°C |
|------------------|---|------------------------------|------------------------|--|---|
| 15327-1210-W01 | Wipe on black fungal growth on dry wall (interior side) | 1 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (135*) 2. <i>Penicillium</i> (35) CFU/in ² = 6.8 x 10 ⁵ | Yes |
| 15327-1210-W02 | Wipe on black fungal growth on dry wall (interior side) | 1 | 40,000X | 1. <i>Penicillium</i> (146) CFU/in ² = 5.8 x 10 ⁶ | Yes |
| 15327-1210-W03 | Wipe on perforated paper behind the dry wall | 1 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (240) 2. <i>Penicillium</i> (1) CFU/in ² = 9.6 x 10 ⁵ | Yes |
| 15327-1210-W04 | Wipe on perforated paper behind the dry wall | 1 | 40,000X | 1. <i>Stachybotrys chartarum</i> *** (360) CFU/in ² = 1.4 x 10 ⁷ | Yes |
| 15327-1210-W05 | Wipe on perforated plastic material behind the dry wall | 1 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (211) 2. <i>Penicillium</i> (1) CFU/in ² = 8.5 x 10 ⁵ | Yes |

| Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|----------------|---|-------------------------|-----------------|--|---|
| 15327-1210-W06 | Wipe on perforated plastic material behind the dry wall | 1 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (166) 2. <i>Penicillium</i> (2) CFU/in ² = 6.7 x 10 ⁵ | Yes |

(B) Bulk sampling on MEA and CCA plates

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|------------------|--|------------|-----------------|--|---|
| 15327-1210-B01-1 | Dry wall sample (interior, brown part) | 0.154 | 40,000X | 1. <i>Penicillium</i> (64) 2. <i>Stachybotrys chartarum</i> *** (5) CFU/g = 1.8 x 10 ⁷ | Yes |
| 15327-1210-B01-2 | Dry wall sample (interior, brown part) | 0.134 | 40,000X | 1. <i>Penicillium</i> (46) 2. <i>Stachybotrys chartarum</i> *** (7) CFU/g = 1.6 x 10 ⁷ | Yes |
| 15327-1210-B01-3 | Dry wall sample (interior, brown part) | 0.113 | 4,000X | 1. <i>Penicillium</i> (51) 2. <i>Stachybotrys chartarum</i> *** (9) CFU/g = 2.1 x 10 ⁶ | Yes |
| 15327-1210-B02-1 | Paper wrapping outside of fiberglass insulation material | 0.107 | 4,000X | 1. <i>Penicillium</i> (42) 2. <i>Stachybotrys chartarum</i> *** (1) CFU/g = 1.6 x 10 ⁶ | Yes |
| 15327-1210-B02-2 | Paper wrapping outside of fiberglass insulation material | 0.096 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (48) 2. <i>Penicillium</i> (18) CFU/g = 2.8 x 10 ⁶ | Yes |

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-------------------|------------|-----------------|---------------------|---|
|-----------|-------------------|------------|-----------------|---------------------|---|

| | | | | | |
|------------------|--|-------|--------|--|-----|
| 15327-1210-B02-3 | Paper wrapping outside of fiberglass insulation material | 0.123 | 4,000X | 1. <i>Stachybotrys chartarum</i> *** (18) 2. <i>Penicillium</i> (10) CFU/g = 9.1 x 10 ⁵ | Yes |
|------------------|--|-------|--------|--|-----|

* Colony counts.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-15R-A

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/21/99

Dates of inoculation: 12/21/99

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling techniques: Air (Andersen N-6 sampler) and contact plate samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 1/3/00

(A) Air samples on MEA and CCA plates

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-------------|-------------------------|----------------|---|--|
| 15327M1, C1 | Room 15327, near window | 84.9 | 1. <i>Aspergillus sp.</i> (1*) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) 4. Basidiomycetes (1) CFU/m ³ = 47 | No |

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| | | | | |
|-------------|-----------------------------|------|--|----|
| 15327M2, C2 | Room 15327, center of room | 84.9 | 1. <i>Cladosporium</i> (2) 2. <i>Penicillium</i> (1) 3. Basidiomycetes (1) | No |
| 15212M1, C1 | Room 15212, near window | 84.9 | CFU/m ³ = 47 1. <i>Paecilomyces</i> (2) 2. <i>Chaetomium</i> (1) 3. Basidiomycetes (2) | No |
| 15212M2, C2 | Room 15212, table in office | 84.9 | CFU/m ³ = 59 1. <i>Aspergillus sp.</i> (1) CFU/m ³ = 12 | No |

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|-----------|-------------------|----------------|--|--|
| OM1, OC1 | Outside bldg. 3 | 84.9 | 1. <i>Cladosporium</i> (7) 2. Basidiomycetes (67) | No |
| OM2, OC2 | Outside bldg. 3 | 28.3 | CFU/m ³ = 872 1. Basidiomycetes (14) | No |
| SB | Shipping blank | NA# | CFU/m ³ = 495 No fungal growth | No |

(B) Contact plate samples on MEA plates

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--|--|
| 15327CP1 | Room 15327, door to room (entrance/exit) | No fungal growth CFU/plate < 1 |
| 15327CP2 | Room 15327, wall near window | 1. <i>Epicoccum</i> (1) CFU/plate = 1 |
| 15327CP3 | Room 15327, front of system furniture, 2 nd station | 1. <i>Alternaria</i> (1) 2. <i>Mucor</i> (1) CFU/plate = 2 |
| 15327CP4 | Room 15327, front of black metal cabinet | 1. <i>Penicillium</i> (5) 2. <i>Stachybotrys chartarum</i> *** (4) CFU/plate = 9 |

| | | |
|----------|--------------------------------------|---|
| 15327CP5 | Room 15327, top of color laser | 1. <i>Penicillium</i> (22) 2. <i>Mucor</i> (1) CFU/plate = 23 |
| 15327CP6 | Room 15327, top of grey file cabinet | 1. <i>Chaetomium</i> (1) CFU/plate = 1 |

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|------------------|---|--|
| 15327CP7 | Room 15327, top of table in front of window | 1. <i>Penicillium</i> (3) 2. <i>Chaetomium</i> (2) 3. <i>Aspergillus sp.</i> (1) 4. <i>Paecilomyces</i> (1) CFU/plate = 7 |
| 15327CP8 | Room 15327, top of scanner | No fungal growth CFU/plate < 1 |
| 15212CP1 | Room 15212, door to room | No fungal growth CFU/plate < 1 |
| 15212CP2 | Room 15212, wall above coffee pot | 1. <i>Alternaria</i> (1) CFU/plate = 1 |
| 15212CP3 | Room 15212, wall near window | 1. <i>Alternaria</i> (1) CFU/plate = 1 |
| 15212CP4 | Room 15212, front of shelves opposite desk | 1. Basidiomycetes (2) CFU/plate = 2 |
| 15212CP5 | Room 15212, top of desk | 1. <i>Cladosporium</i> (1) 2. <i>Penicillium</i> (1) CFU/plate = 2 |
| 15212CP6 | Room 15212, top of computer | 1. <i>Alternaria</i> (1) 2. Basidiomycetes (3) CFU/plate = 4 |
| 15212CP7 | Room 15212, file cabinet of coffee pot | 1. <i>Penicillium</i> (3) 2. <i>Paecilomyces</i> (2) CFU/plate = 5 |

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--|---|
| 15212CP8 | Room 15212, book shelf (open), front of books | 1. <i>Chaetomium</i> (20) 2. <i>Penicillium</i> (11) 3. <i>Cladosporium</i> (7) CFU/plate = 38 |

* Colony counts.

*** Toxigenic fungi.

Not applicable.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-15R-B

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/21/99

Dates of inoculation: 12/22/99

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling technique: Wipe samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 1/3/00

Wipe samples on MEA and CCA plates

| FOH ID | Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|--------|-----------|-----------------------------|-------------------------|-----------------|---|---|
| 1 | 15212S1 | Room 15212, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 2 | 15212S2 | Room 15212, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |

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|---|---------|-----------------------------|---|-----|---|----|
| 3 | 15212R1 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 4 | 15212R2 | Room 15212, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 5 | 15327S1 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 6 | 15327S2 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 7 | 15327S3 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |

| FOH ID | Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|--------|-----------|-----------------------------|-------------------------|-----------------|---|---|
| 8 | 15327S4 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 9 | 15327S5 | Room 15327, supply diffuser | 4 | 10X | No fungal growth CFU/in ² < 3 | No |
| 10 | 15327R1 | Room 15327, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 11 | 15327R2 | Room 15327, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 12 | 15327R3 | Room 15327, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |
| 13 | 15327R4 | Room 15327, return | 5 | 10X | No fungal growth CFU/in ² < 2 | No |

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-15R-C

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 12/21/99

Dates of inoculation: 12/23/99

General location: SSMC-3, Silver Spring, MD**Specific location: 15th floor****Sampling technique: Vacuum dust sampling****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: J. Sobelman****Date characterization completed: 1/3/00**

(A) Dust samples on MEA and CCA plates

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|---------------------------------|------------|--------------------|--|---|
| 15327FC | Room 15327, furniture composite | 0.037# | 40X-MEA 40X-CCA | 1. <i>Alternaria</i> (14*) 2. <i>Cladosporium</i> (7) 3. <i>Aureobasidium</i> (4) 4. <i>Epicoccum</i> (4) 5. <i>Bipolaris</i> (3) 6. <i>Chaetomium</i> (2) 7. <i>Penicillium</i> (1) CFU/g = 1.9 x 10 ⁴ | Yes (4) CFU/g = 2,162 |
| 15327CA | Room 15327, carpet | 0.100 | 40X-MEA 40X-CCA | 1. <i>Penicillium</i> (18) 2. <i>Stachybotrys chartarum</i> *** (6) 3. <i>Cladosporium</i> (3) 4. <i>Alternaria</i> (2) 5. <i>Aureobasidium</i> (2) 6. <i>Aspergillus sp.</i> (1) 7. <i>Epicoccum</i> (1) CFU/g = 1.3 x 10 ⁴ | Yes (5) CFU/g = 2.0 x 10 ³ |

| Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C |
|-----------|-------------------|------------|-----------------|---------------------|---|
| | | | | | |

| | | | | | |
|---------|---------------------------------|--------|--------------------|--|----|
| 15212FC | Room 15212, furniture composite | 0.010# | 40X-MEA 10X-CCA | 1. <i>Alternaria</i> (5) 2. <i>Aspergillus flavus</i> *** (2) 3. <i>Aureobasidium</i> (2) 4. <i>Cladosporium</i> (2) 5. <i>Paecilomyces</i> (1) 6. Basidiomycetes (44) CFU/g = 1.1×10^5 | No |
|---------|---------------------------------|--------|--------------------|--|----|

(B) Dust sample on MEA plates by direct plating

| Sample ID | Sampling Location | Fungi detected on MEA @ 25°C |
|-----------|--------------------|-------------------------------|
| 15212CA## | Room 15212, carpet | <i>Aureobasidium</i> yeast |

* Colony counts.

*** Toxigenic fungi.

5ml of sterilized distilled water were added instead of 10ml.

Insufficient amounts of dust for analysis.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-21R**Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD****POIS#/task #: D8H00CO31200 / 9903****Sampling date: 1/24/00**

Dates of inoculation: 1/24/00 (airs and contact plates) and 1/28/00 (dust)

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor**Sampling techniques: Air (Andersen N-6 sampler), contact plate, and vacuum dust samplings****Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi****Samples submitted by: J. Sobelman****Date characterization completed: 2/7/00**

(A) Air samples on MEA and CCA plates

| Sample ID | Sampling Location | Air Volume (L) | Fungi on MEA @ 25° C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|----------------|--|----------------|--|--|
| 15212124A1, A2 | 15 th floor, room 15212, center | 84.9 | No fungal growth CFU/m ³ < 12 | No |
| Field blank | Blank | NA# | No fungal growth | No |
| 15327124A1, A2 | 15 th floor, room 15327, center | 84.9 | No fungal growth CFU/m ³ < 12 | No |
| 124OA1, OA2 | Outside bldg. 3 | 84.9 | 1. <i>Penicillium</i> (4*) | No |
| 124OA3, OA4 | Outside bldg. 3 | 28.3 | CFU/m ³ = 47 1. <i>Penicillium</i> (4) | No |
| SB | Shipping blank | NA | CFU/m ³ = 141 No fungal growth | No |

(B) Contact plate samples on MEA plates

| FOH ID | Sample ID | Sampling Location | Fungi detected on MEA @ 25° C |
|--------|-------------|--|---|
| 25 | 15212124CP1 | 15 th floor, room 15212, door to room | No fungal growth CFU/plate < 1 |
| 26 | 15212124CP2 | 15 th floor, room 15212, wall above coffee pot | 1. <i>Mucor</i> (2) 2. <i>Alternaria</i> (1) CFU/plate = 3 |
| 27 | 15212124CP3 | 15 th floor, room 15212, wall near window | 1. <i>Cladosporium</i> (3) 2. <i>Alternaria</i> (2) 3. <i>Mucor</i> (2) |
| 28 | 15212124CP4 | 15 th floor, room 15212, front of shelves opposite desk | CFU/plate = 7 No fungal growth CFU/plate < 1 |

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|----|-------------|--|--|
| 29 | 15212124CP5 | 15 th floor, room 15212, top of desk | 1. <i>Chaetomium</i> (2) 2. <i>Aspergillus sp.</i> (1) 3. <i>Penicillium</i> (1) CFU/plate = 4 |
| 30 | 15212124CP6 | 15 th floor, room 15212, top of computer | 1. <i>Cladosporium</i> (1) 2. <i>Paecilomyces</i> (1) 3. Basidiomycetes (1) CFU/plate = 3 |
| 31 | 15212124CP7 | 15 th floor, room 15212, top of file with coffee pot | 1. <i>Aspergillus sp.</i> (1) CFU/plate = 1 |
| 32 | 15212124CP8 | 15 th floor, room 15212, open edge of book shelf, front of book | 1. <i>Penicillium</i> (12) 2. <i>Cladosporium</i> (8) 3. <i>Aspergillus niger</i> ** (2) 4. <i>Aureobasidium</i> (1) 5. Basidiomycetes (48) CFU/plate = 71 |

| FOH ID | Sample ID | Sampling Location | Fungi detected on MEA @ 25° C |
|--------|-------------|--|---|
| 33 | 15327124CP1 | 15 th floor, room 15327, door to room | No fungal growth CFU/plate < 1 |
| 34 | 15327124CP2 | 15 th floor, room 15327, wall near window | No fungal growth CFU/plate < 1 |
| 35 | 15327124CP3 | 15 th floor, room 15327, 2 nd station, front of system furniture | No fungal growth CFU/plate < 1 |
| 36 | 15327124CP4 | 15 th floor, room 15327, front of black metal cabinet | No fungal growth CFU/plate < 1 |
| 37 | 15327124CP5 | 15 th floor, room 15327, top of color laser | No fungal growth CFU/plate < 1 |
| 38 | 15327124CP6 | 15 th floor, room 15327, top of grey file cabinet | No fungal growth CFU/plate < 1 |
| 39 | 15327124CP7 | 15 th floor, room 15327, top of table in front of window | No fungal growth CFU/plate < 1 |
| 40 | 15327124CP8 | 15 th floor, room 15327, top of scanner | 1. <i>Cladosporium</i> (1) 2. <i>Penicillium</i> (1) CFU/plate = 2 |

(C) Vacuum dust samples on MEA and CCA plates

| FOH ID | Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|--------|-------------|---|---------------------|--------------------|--|--|
| V07 | 15212124V01 | 15 th floor, room 15212, carpet | 0.101 | 40X-MEA 10X-CCA | 1. <i>Paecilomyces</i> (4) 2. <i>Alternaria</i> (1) 3. <i>Chaetomium</i> (1) 4. <i>Penicillium</i> (1) 5. <i>Trichoderma</i> (1) CFU/g = 3,168 | No |
| V08 | 15212124V02 | 15 th floor, room 15212, furniture | 0.041 ^{##} | 40X-MEA 10X-CCA | 1. <i>Cladosporium</i> (10) 2. <i>Alternaria</i> (9) 3. <i>Penicillium</i> (3) 4. <i>Epicoccum</i> (2) CFU/g = 1.2 x 10 ⁴ | No |
| V09 | 15327124V01 | 15 th floor, room 15327, carpet | 0.085 | 40X-MEA 40X-CCA | 1. <i>Penicillium</i> (25) 2. <i>Stachybotrys chartarum</i> *** (7) 3. <i>Aureobasidium</i> (5) 4. <i>Cladosporium</i> (3) 5. <i>Pithomyces</i> (1) CFU/g = 1.9 x 10 ⁴ | Yes (8) CFU/g = 3,765 |

| FOH ID | Sample ID | Sampling Location | Weight (g) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|--------|-----------|-------------------|------------|-----------------|---------------------|--|
| | | | | | | |

INDOOR AIR QUALITY SURVEY REPORT

| | | | | | | |
|-----|-------------|---|---------|--------------------|---|----|
| V10 | 15327124V02 | 15 th floor, room 15327, furniture | 0.101## | 40X-MEA 10X-CCA | 1. <i>Alternaria</i> (16) 2. <i>Epicoccum</i> (8) 3. <i>Penicillium</i> (6) 4. <i>Aspergillus sp.</i> (1) 5. <i>Bipolaris</i> (1) 6. <i>Pithomyces</i> (1) CFU/g = 6,535 | No |
|-----|-------------|---|---------|--------------------|---|----|

* Colony counts.

*** Toxigenic fungi.

Not applicable.

5ml of sterilized distilled water were added instead of 10ml.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-23R

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/1/00

Dates of inoculation: 2/2/00

General location: SSMC-3, Silver Spring, MD

Specific location: 15th floor

Sampling techniques: Wipe samplings

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/12/00

Wipe samples on MEA and CCA plates

| FOH ID | Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|--------|-----------|---|-------------------------|--------------------|---|--|
| W01 | 1521221R1 | 15 th floor, room 15212, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |

INDOOR AIR QUALITY SURVEY REPORT

| | | | | | | |
|-----|-----------|--|---|--------------------|--|----|
| W02 | 1521221R2 | 15 th floor, room 15212, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |
| W03 | 1521221S1 | 15 th floor, room 15212, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W04 | 1521221S2 | 15 th floor, room 15212, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W05 | 1532721S1 | 15 th floor, room 15327, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W06 | 1532721S2 | 15 th floor, room 15327, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W07 | 1532721S3 | 15 th floor, room 15327, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W08 | 1532721S4 | 15 th floor, room 15327, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |

| FOH ID | Sample ID | Sampling Location | Area (in ²) | Dilution factor | Fungi on MEA @ 25°C | Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C |
|--------|-----------|--|-------------------------|--------------------|--|--|
| W09 | 1532721S5 | 15 th floor, room 15327, supply diffuser | 4 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 10 | No |
| W10 | 1532721R1 | 15 th floor, room 15327, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |
| W11 | 1532721R2 | 15 th floor, room 15327, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |
| W12 | 1532721R3 | 15 th floor, room 15327, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |
| W13 | 1532721R4 | 15 th floor, room 15327, return trougher | 5 | 40X-MEA 10X-CCA | No fungal growth CFU/in ² < 8 | No |
| Blank | Blank | Field blank | NA# | 40X-MEA 10X-CCA | No fungal growth | No |

*** Toxigenic fungi.

Not applicable.

ATTACHMENT C

Results from microscopic examination of air and tape lift samples collected from rooms 15327 and 15212 of SSMC-3, in December, 1999 and January 2000.

All attachments can be retrieved from the Library located on the Second Floor in SSMC 3

ATTACHMENT D

Revised small-scale drywall removal protocol.